

N74368B US HF HXJ amended seq listing - Jul 11.txt
SEQUENCE LISTING

<110> ST GEORGE'S HOSPITAL MEDICAL SCHOOL

<120> DIAGNOSTICS AND VACCINES FOR MYCOBACTERIAL INFECTIONS
OF ANIMALS AND HUMANS

<130> N74368B DMG

<140> US 09/646,568

<141> 2000-09-11

<150> PCT/GB99/00849

<151> 1999-03-18

<150> UK 9806093.2

<151> 1998-03-20

<160> 7

<170> PatentIn Ver. 2.1

<210> 1

<211> 1335

<212> DNA

<213> Mycobacterium avium

<400> 1

```
gtgactgaag ccaatgagtg caactcggcg tcgcgaaagg tttcagtcgc ggttgagcaa 60
gacaccgcaa gactactgga gtgcgtgcac aagcgccccc agctcgcggc tgaaagcgga 120
tgcaaagggg ttcgaagctt gagcaacatg cgaaggggag aacggcctat gagcctggga 180
cagggttttcg acccgcgcgcg gaatgcactt aatgcgtggc gcttggtggtt ggcgagcggg 240
gtgatcctat ggcatttcgtt tccgctcact ggacgtatgc cgtgggcgcc gttcgtccag 300
ttgcttgccc ttggatgcgt tgatggtttc tttgcggtct ccggctatct catcgtctcg 360
agctggcttc gcaaccgcga tcccgcccaa tacttcaccg ctcatgtctt tcgtattctc 420
ccgggtctgt ggatctgtct catcttgacg gcgtttgtca tcgctccgat aggtgtgggc 480
gcccagggcg gttcggccgc gaaactactg atgtccggcg ctccgatcga gtatgtgcta 540
aaagacagtg cggtttggat ggtaagttc gatatcggtg gcacacctcg cgatattcca 600
gttgcgggta tttggaacgg ttctctgtgg acattggggtt gggaggtgct ttgctatatc 660
ggcgtagcag tatttggtat gctcggactt cttagtcgcc gttgggttcgt tccagggata 720
ttgatccttg cgctgtcgtg gtcggtgttc ttgccggcat ggggcggaat acacgcgatc 780
gcctccaatg ctgcgcgatt cgctgtgatg ttttcggccg gagcgttgct gtatcaattc 840
cgtaacgtga ttccggctcg gtggtccttc gttgccgctg gcctcattat cgttgtgggt 900
tcctctgccg tgctgcccga ctaccggttg gtggcggccc ttccgatggc gtacctaata 960
atcgcttcgg gttcgctcat ccacaatcaa aggatgaggt tccgcaccga tctatcctat 1020
ggagtatata tttatgcgtt tccaattcag caagtgtctg tcctgtgtgg attcgccgag 1080
ataaatccaa tcgctttctg cgcgatttct gtcgcagcta ttttgccgct cgccgcgctc 1140
agtttggttct tggtcgagaa acctgcgttg tcctggaaga gtcgtctccg gcggaaaaac 1200
agttcaattg cgctagccaa tatggaagat ggtggatcag tcggccgctc aaatgacatt 1260
cccggaaggc gggcccgcgtt tattggcgag aaagccgaag atcctcccgc gccgagccca 1320
agaccggcct tgttaa                                     1335
```

<210> 2

<211> 444

<212> PRT

<213> Mycobacterium avium

<400> 2

Val Thr Glu Ala Asn Glu Cys Asn Ser Ala Ser Arg Lys Val Ser Val
1 5 10 15

Ala Val Glu Gln Asp Thr Ala Arg Leu Leu Glu Cys Val His Lys Arg
20 25 30

N74368B US HF HXJ amended seq listing - Jul 11.txt

Pro Gln Leu Ala Ala Glu Ser Gly Cys Lys Gly Val Arg Ser Leu Ser
35 40 45
Asn Met Arg Arg Gly Glu Arg Pro Met Ser Leu Gly Gln Val Phe Asp
50 55 60
Pro Arg Ala Asn Ala Leu Asn Ala Trp Arg Leu Val Leu Ala Ser Gly
65 70 75 80
Val Ile Leu Trp His Ser Phe Pro Leu Thr Gly Arg Met Pro Trp Ala
85 90 95
Pro Phe Val Gln Leu Leu Gly Leu Gly Cys Val Asp Gly Phe Phe Ala
100 105 110
Val Ser Gly Tyr Leu Ile Val Ser Ser Trp Leu Arg Asn Pro His Pro
115 120 125
Ala Gln Tyr Phe Thr Ala Arg Cys Leu Arg Ile Leu Pro Gly Leu Trp
130 135 140
Ile Cys Leu Ile Leu Thr Ala Phe Val Ile Ala Pro Ile Gly Val Gly
145 150 155 160
Ala Gln Gly Gly Ser Ala Ala Lys Leu Leu Met Ser Gly Ala Pro Ile
165 170 175
Glu Tyr Val Leu Lys Asp Ser Ala Val Trp Met Val Lys Phe Asp Ile
180 185 190
Gly Gly Thr Pro Arg Asp Ile Pro Val Ala Gly Ile Trp Asn Gly Ser
195 200 205
Leu Trp Thr Leu Gly Trp Glu Val Leu Cys Tyr Ile Gly Val Ala Val
210 215 220
Phe Gly Met Leu Gly Leu Leu Ser Arg Arg Trp Phe Val Pro Gly Ile
225 230 235 240
Leu Ile Leu Ala Leu Ser Trp Ser Val Phe Leu Pro Ala Trp Gly Gly
245 250 255
Ile His Ala Ile Ala Ser Asn Ala Ala Arg Phe Ala Val Met Phe Ser
260 265 270
Ala Gly Ala Leu Leu Tyr Gln Phe Arg Asn Val Ile Pro Ala Arg Trp
275 280 285
Ser Phe Val Ala Val Gly Leu Ile Ile Val Val Val Ser Ser Ala Val
290 295 300
Leu Pro Asp Tyr Arg Leu Val Ala Ala Leu Pro Met Ala Tyr Leu Ile
305 310 315 320
Ile Ala Ser Gly Ser Leu Ile His Asn Gln Arg Met Arg Phe Arg Thr
325 330 335
Asp Leu Ser Tyr Gly Val Tyr Ile Tyr Ala Phe Pro Ile Gln Gln Val
340 345 350
Leu Val Leu Cys Gly Phe Ala Glu Ile Asn Pro Ile Ala Phe Cys Ala
355 360 365

N74368B US HF HXJ amended seq listing - Jul 11.txt

Ile Ser Val Ala Ala Ile Leu Pro Leu Ala Ala Leu Ser Trp Phe Leu
 370 375 380
 Val Glu Lys Pro Ala Leu Ser Trp Lys Ser Arg Leu Arg Arg Lys Asn
 385 390 395 400
 Ser Ser Ile Ala Leu Ala Asn Met Glu Asp Gly Gly Ser Val Gly Arg
 405 410 415
 Ser Asn Asp Ile Pro Gly Arg Arg Ala Arg Phe Ile Gly Glu Lys Ala
 420 425 430
 Glu Asp Pro Pro Ala Pro Ser Pro Arg Pro Ala Leu
 435 440

<210> 3
 <211> 2543
 <212> DNA
 <213> Mycobacterium avium

<400> 3
 atgcactgtc aatggccaag tagaagtccc cgctgggtggc cagcagaagt cccactccg 60
 ctgcgggtgg ttggctaatt cttggcggct cccttcttgt ggtcggcgtg ggcacatccg 120
 taggactcgc cggaggtgac gacgatgctg gcgtgggtgca gcagccgatc gaggatgctg 180
 gcggcggtgg tgtgctcggg caggaatcgc cccatttgtt cgaaggcca atgcgaggcg 240
 atggccaggg agcggcgctc gtagccggca gccacgagcc ggaacaacag ttgagtcccg 300
 gtgtcgtcga gcggggcgaa gccgatctcg tccaagatga ccagatccgc gcggagcagg 360
 gtgtcgatga tcttgccgac ggtgttgtcg gccaggccgc ggtagaggac ctcgatcagg 420
 tcggcgggcg tgaagtagcg gactttgaat ccggcgtgga cggcagcgtg cccgcagccg 480
 atgagcaggt gacttttgcc cgtaccaggt gggccaatga ccgccaggtt ctgttgtgcc 540
 cgaatccatt ccaggctcga caggtagtcg aacgtggctg cggtagatga cgatccggcg 600
 acgtcgaacc cgtcgagggt cttggtgacc gggaaggctg cggccttgag acggttggcg 660
 gtgttgagg catcgcgggc agcgatctcg gcctcaacca acgtccgcag gatctcctcc 720
 ggtgtccagc gttgcgtctt ggcgacttgc aacacctcg cggcgttgcg gcgcaccgtg 780
 gccagcttca accgccgcag cgccgcgtca aggtcagcag ccagcggctg cgcggaggac 840
 ggtgccaccg gcttggcagc ggtggtcatg aggccgtccc gtcggtggtg ttgatcttgt 900
 aggcctccaa cgagcgggtc tcgacggtga gcagatcgag cacgagtgcg tcgccggcg 960
 ggccgggttg tggggtgccc gcgcggcgcg ccaggatcga gcgcacgtcg gcagcgcgga 1020
 accggcgaaa cgcaaccgcc cggcgcagcg cgtcaatcaa agcctgttcg ccgtgggccc 1080
 cgccaaggcc gagcagaatg tcgagttcgg atttcagtcg ggtgttgccg atcgagcag 1140
 caccgacgag gaactgctgc gcttcggttc ccaatgcgca gaatcgtttc tctgcttggg 1200
 ttttcgggcy aggaccacgc gagggtgcyg gtcgtgggtc gtcgtagtgt tcacgagga 1260
 tggacacctc acctgggtcg acgagctcgt gctcgccac gatcacaccg gtcgaggtt 1320
 ccaacaggat caggcgcca tgatcgacca ccaccgccac ggtggcaccg acgagccgct 1380
 gaggcaccga gtaacgagct gagccgtaac ggatgcacga gaggccgtcg accttacggc 1440
 gcaccgaccc cgagccgatc gtcggccgca gcgagggcag ctccctcaag acggtgcgct 1500
 cgtcaaccaa gcgatcgttg ggcacggcgc agatctccga gtggaccgtg gcattgacct 1560
 cggcgaccaa tagttgcgc tgggctgtga gggcagtag gtcgacctgc tcaccggcta 1620
 acgcagcttc ggtcagcagc ggcaccgcaa ggtcgtcctg agcgtagcca cagaggttct 1680
 ccacgatgcc cttcgattgc ggatccgcac cgtggcagaa gtccggaacg aagccatagt 1740
 gggacgcgaa tcgcacataa tccggtgttg gaacaacaac attggcgacg acaccacctt 1800
 tgaggcagcc catccggtcg gccaggatct tggccggaac cccaccgatc gcctcgaggg 1860
 cttcggttat catcgcttgc gtggtcgagg ctttctcgtc ggccggcgaac cgctcaaacc 1920
 gccaccgcga ataggccagc tccgcgcata accacatcag ccccggtgac gcttcggccc 1980
 aatccatcac cagatagtag ccgggtgacc agaccgccc acggcggtga tgccgggttag 2040
 cgttgcgcca ccatacttcc tgctcggtta ccaggcgggc gaagttacgg gccgagccct 2100
 gatacccgcc agctcgggcy atcggcagca tccgcttcgc cgacatcttg ccgtgtgatt 2160
 tctcgactcg ggtggcgact agatcggtga acgcgtcgag gttgcgtggc cgtggttccc 2220
 gcggggcgcc gccaccggcc tcggcccgtc cgatgaccgc cttgaccgtc ttgtgcgtac 2280
 taccgcacag ctcggccgcy ccgcgatacg acccgacctg gtgatacgcc gaaatgatgt 2340
 tcatacgctc cttgcagac ttcaatagag ctccctgggc ggtgatcaag tgacagttgg 2400

N74368B US HF HXJ amended seq listing - Jul 11.txt

cgctatcacc gtcaccgccc aggccctcag ctcccggaaa agacacgacg agcccgctaa 2460
ggagtgggga cttctacctg gccaccagtg gggacttcct actggccaca gatggggact 2520
ttctcatggc catggacatg cac 2543

<210> 4

<211> 2543

<212> DNA

<213> Mycobacterium avium

<400> 4

gtgcatgtcc atggccatga gaaagtcccc atctgtggcc agtaggaagt cccactgggt 60
ggccaggtag aagtccccac tccttagcgg gctcgtcgtg tcttttcgg gagctgaggg 120
cctgggagggt gacgggtgata gcgccaactg tcacttgatc accgcccagg gagctctatt 180
gaagtctgca agggagcgta tgaacatcat ttccggcgtat caccagggtcg ggtcgtatcg 240
cggcgcggcc gagctgtgcg gtagtacgca caagacggtc aagcgggtca tcgagcgggc 300
cgaggcggtt ggccgcggcc cgcggaacc acggccacgc aacctcgacg cgttcaccga 360
tctagtgcgc acccgagtcg agaaatcaca cggaagatg tcggcgaagc ggatgctgcc 420
gatcgcccga gctgccgggt atcagggtc ggcccgtaac ttccgcccgc tggtagccga 480
gcaggaagta tggtagcgca acgctaaccg gcatcaacgc cgtccggcgg tctggtcacc 540
cggtagctat ctggtgatgg attgggcccga agcggcaccg gggctgatgg tgttatgccc 600
ggagctggcc tattcgcggt ggcggtttga gcggttcgcc gccgacgaga aagcctcgac 660
cagcagggcg atgatagcgg aagccctcga ggcgatcggg ggggttcggg ccaagatcct 720
ggccgaccgg atgggctgcc tcaaagggtg tgtcgtcgcc aatgttgtt ttccaacacc 780
ggattatgtg cgattcgctg cccactatgg cttcgttcgg gacttctgcc acggtgcgga 840
tccgcaatcg aagggcacg tggagaacct ctgtggctac gctcaggacg accttgcggt 900
gccgctgctg accgaagctg cgttagccgg tgagcaggtc gacctacgtg cctcaacgc 960
ccagctgcaa ctatgggtcg ccgaggtcaa tgccacggtc cactcgaga tctgcgccg 1020
gccaacgat cgcttggttg acgagcgac cgtcttgagg gagctgccct cgctgcggcc 1080
gacgatcggc tcggggtcgg tgcgccgtaa ggtcgacggc ctctcgtgca tccgttacgg 1140
ctcagctcgt tactcggtgc ctcagcggct cgtcggtgcc accgtggcgg tggtagtcga 1200
tcatggcgcc ctgatcctgt tggaaacctg gaccggtgtg atcgtggccg agcacgagct 1260
cgtcagccca ggtgaggtgt ccattcctga tgaacactac gacggacca gaccgcacc 1320
ctcgcgtggt cctcgcccga aaacccaagc agagaaacga ttctgcgcg tgggaaccga 1380
agcgcagcag ttctcgtcgt gtgctgctgc gatcggcaac acccgactga aatccgaact 1440
cgacattctg ctcggccttg gcgcccga cggaacag gctttgattg acgcgctgcg 1500
ccgggcgggt gcgtttcgcc ggttcgcgc tgccgacgtg cgctcgatcc tggccgcccg 1560
cgccggcacc ccacaacccc gccccgcccg cgacgcactc gtgctcgatc tgcccaccgt 1620
cgagaccgca tcgttgagg cctacaagat caacaccacc gacgggacgg cctcatgacc 1680
accgctgcca agccggtggc accgtcctcg gcggcaccgc tggctgctga ccttgacgcg 1740
gcgctgcggc ggttgaagct ggccacgggt gcgccgaacg ccgccgaggt gttgcaagtc 1800
gccaagacgc aacgctggac accggaggag atcctgcgga cgttggttga ggccgagatc 1860
gctgcccgcg atgcctcaa caccgccaac cgtctcaagg ccgagcctt cccggtcacc 1920
aagaccctcg acgggttcga cgtcaccgga tcgtcgatca ccgagccac gttcgactac 1980
ctgtcgagcc tggaaatgat tcgggcacaa cagaacctgg cggtcattgg cccacctggt 2040
acgggcaaaa gtcacctgct catcggtgc gggcacgctg ccgtccacgc cggattcaaa 2100
gtccgctact tcaccgccc cgacctgatc gaggtcctct acccgggcct ggccgacaac 2160
accgtcggca agatcatcga caccctgctc gcgcggatc tggatcatct ggacgagatc 2220
ggcttcgccc cgctcgacga caccgggact caactgttgt tccggctcgt ggctgcccgc 2280
tacgagcgcc gctccctggc catcgccctg cattggccct tcgaacaatg ggggcgattc 2340
ctgcccagag acaccaccgc cgccagcatc ctcgatcggc tgctgcacca cgccagcatc 2400
gtcgtcacct ccggcgagtc ctaccggatg cgccacgccc accacaagaa gggagccgccc 2460
aagaattagc caaccaccgc cagcggagtg gggacttctg ctggccacca gcggggactt 2520
ctacttggcc attgacagt cat 2543

<210> 5

<211> 526

<212> PRT

<213> Mycobacterium avium

<400> 5

Val Ser Phe Pro Gly Ala Glu Gly Leu Gly Gly Asp Gly Asp Ser Ala
1 5 10 15

N74368B US HF HXJ amended seq listing - Jul 11.txt

Asn Cys His Leu Ile Thr Ala Gln Gly Ala Leu Leu Lys Ser Ala Arg
20 25 30

Glu Arg Met Asn Ile Ile Ser Ala Tyr His Gln Val Gly Ser Tyr Arg
35 40 45

Gly Ala Ala Glu Leu Cys Gly Ser Thr His Lys Thr Val Lys Arg Val
50 55 60

Ile Glu Arg Ala Glu Ala Gly Gly Ala Pro Pro Arg Glu Pro Arg Pro
65 70 75 80

Arg Asn Leu Asp Ala Phe Thr Asp Leu Val Ala Thr Arg Val Glu Lys
85 90 95

Ser His Gly Lys Met Ser Ala Lys Arg Met Leu Pro Ile Ala Arg Ala
100 105 110

Ala Gly Tyr Gln Gly Ser Ala Arg Asn Phe Arg Arg Leu Val Ala Glu
115 120 125

Gln Glu Val Trp Trp Arg Asn Ala Asn Arg His Gln Arg Arg Pro Ala
130 135 140

Val Trp Ser Pro Gly Asp Tyr Leu Val Met Asp Trp Ala Glu Ala Ala
145 150 155 160

Pro Gly Leu Met Val Leu Cys Ala Glu Leu Ala Tyr Ser Arg Trp Arg
165 170 175

Phe Glu Arg Phe Ala Ala Asp Glu Lys Ala Ser Thr Thr Gln Ala Met
180 185 190

Ile Ala Glu Ala Leu Glu Ala Ile Gly Gly Val Pro Ala Lys Ile Leu
195 200 205

Ala Asp Arg Met Gly Cys Leu Lys Gly Gly Val Val Ala Asn Val Val
210 215 220

Val Pro Thr Pro Asp Tyr Val Arg Phe Ala Ser His Tyr Gly Phe Val
225 230 235 240

Pro Asp Phe Cys His Gly Ala Asp Pro Gln Ser Lys Gly Ile Val Glu
245 250 255

Asn Leu Cys Gly Tyr Ala Gln Asp Asp Leu Ala Val Pro Leu Leu Thr
260 265 270

Glu Ala Ala Leu Ala Gly Glu Gln Val Asp Leu Arg Ala Leu Asn Ala
275 280 285

Gln Ala Gln Leu Trp Cys Ala Glu Val Asn Ala Thr Val His Ser Glu
290 295 300

Ile Cys Ala Val Pro Asn Asp Arg Leu Val Asp Glu Arg Thr Val Leu
305 310 315 320

Arg Glu Leu Pro Ser Leu Arg Pro Thr Ile Gly Ser Gly Ser Val Arg
325 330 335

Arg Lys Val Asp Gly Leu Ser Cys Ile Arg Tyr Gly Ser Ala Arg Tyr
340 345 350

N74368B US HF HXJ amended seq listing - Jul 11.txt

Ser Val Pro Gln Arg Leu Val Gly Ala Thr Val Ala Val Val Val Asp
355 360 365

His Gly Ala Leu Ile Leu Leu Glu Pro Ala Thr Gly Val Ile Val Ala
370 375 380

Glu His Glu Leu Val Ser Pro Gly Glu Val Ser Ile Leu Asp Glu His
385 390 395 400

Tyr Asp Gly Pro Arg Pro Ala Pro Ser Arg Gly Pro Arg Pro Lys Thr
405 410 415

Gln Ala Glu Lys Arg Phe Cys Ala Leu Gly Thr Glu Ala Gln Gln Phe
420 425 430

Leu Val Gly Ala Ala Ala Ile Gly Asn Thr Arg Leu Lys Ser Glu Leu
435 440 445

Asp Ile Leu Leu Gly Leu Gly Ala Ala His Gly Glu Gln Ala Leu Ile
450 455 460

Asp Ala Leu Arg Arg Ala Val Ala Phe Arg Arg Phe Arg Ala Ala Asp
465 470 475 480

Val Arg Ser Ile Leu Ala Ala Gly Ala Gly Thr Pro Gln Pro Arg Pro
485 490 495

Ala Gly Asp Ala Leu Val Leu Asp Leu Pro Thr Val Glu Thr Arg Ser
500 505 510

Leu Glu Ala Tyr Lys Ile Asn Thr Thr Asp Gly Thr Ala Ser
515 520 525

<210> 6
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Mpa specific primer (P12)

<400> 6
agcgagctca cgtgactgaa gcc 23

<210> 7
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Mpa specific primer (P13)

<400> 7
gctctgcagc cggaacacaa cgc 23